

A NATURAL RIDDLE

Attraction of Gravitation Is a Mystery to Science.

IT CONTROLS THE UNIVERSE.

Yet That Wonderful Force That Directs and Regulates Moons, Planets, Stars and Stars Without Visible Means of Connection Is Inexplicable.

The mystery of mysteries in science is the attraction of gravitation—that very force of nature that is the most familiar to us all. It seems strange that the most familiar thing in the world should be at the same time the most inexplicable, but so it is.

In order to see clearly wherein the mystery consists, let us first consider what gravitation appears to be. It is gravitation that gives the property of weight to all bodies. If there were no gravitation we could float like thistle-downs and infinitely better than thistle-downs, for they, too, are finally brought down by gravitation.

It is gravitation that brings a cannon ball eventually to the earth, no matter how swiftly it may be projected. The faster it starts the farther it will go, but during every second of its flight it drops the same distance vertically toward the earth, whether the speed imparted to it by the powder is 500 or 3,000 feet per second. Gravitation acts on a moving body exactly as well as on one at rest.

It is gravitation that curbs the motion of the moon and keeps it in an orbit of which the earth is the active focus.

So, too, it is gravitation that governs the earth in its motion around the sun, preventing it from flying away into boundless space. Astronomy shows that gravitation acts between all the planets and all the stars and controls their motions with respect to one another.

Now, this mysterious force appears to be an attraction, as if there were elastic cords connecting all the bodies in space and tending to draw them together. But space, as far as our senses can detect, is empty. There are no elastic cords and no physical connections whatever between astronomical bodies or between a flying stone or cannon ball and the earth. How, then, can there be an attraction? In order that a body may be attracted or drawn there must be something to draw it. Gravitation does the trick, but completely hides from us the mechanism through which it acts. We can discover no mechanism at all.

When an unfortunate aeroplanist drops from his machine at a height of a thousand feet he begins at once to fall toward the earth as if it were pulling him. But how can it pull if it has nothing to pull with? You may think at first sight that it is the air which acts as an intermediary, but that is not so, because the earth and the moon "pull" upon one another with a force equal to the strength of a steel cable 500 miles in diameter. But there is no air and no other tangible thing in the open space, 240,000 miles across, that gaps between the moon and the earth.

Then, gravitation exerts the same force at every instant. No matter how fast the falling aeroplanist may be descending at any moment, gravitation will keep on adding speed as if he had just started. Disregarding the slight retardation produced by the resistance of the air, he will fall sixteen feet in the first second, forty-eight feet in the second, eighty feet in the third, gaining thirty-two feet in his velocity during every second after the first.

From a height of 1,000 feet he will come down in about eight seconds, and will strike the ground with a velocity of about 256 feet per second. From a height of 10,000 feet he would fall in about twenty-five seconds and would strike with a velocity of 400 feet per second.

The same kind of calculation can be applied to the gravitation between the earth and the moon. If the moon were not in motion across the direction of the earth's "pull" it would fall to the earth in about 116 hours.

Now, to return to the mystery, how is this force exerted? Is it really a pull, as it seems to be? The answer to which science is tending is that instead of being a pull, gravitation is a push; in other words, that the falling aeroplanist is pushed toward the ground and the moon is pushed toward the earth.

On the face of it one might think that nothing was gained by this theory, because it seems as impossible that a push should be exerted without a tangible connection as a pull. But the clue is found in the supposed properties of that invisible, intangible, all-pervading medium called the ether.

This, to be sure, is explaining one mystery by another, for we know nothing about the ether except that it conveys the waves of light and electricity; but, at any rate, it affords a conceivable explanation of gravitation. Dr. Charles F. Brush's theory regards the ether as being filled with a peculiar form of waves and that material bodies may intercept these waves in such a way as to be pushed toward one another on account of the diminished effect of the ether waves in the space between the bodies.—Garrett P. Serviss in New York Journal.

If you know how to spend less than you get you have the philosopher's stone.—Benjamin Franklin.

TRIALS OF AN EXPLORER.

Sickness and Agony That Livingstone Endured In Africa.

Writing on David Livingstone, missionary and African explorer, Sir Harry H. Johnston says in the British Geographical Journal: "During the winter or rainy season of 1883-4 Livingstone was very ill. He had been wet times without number and suffered from terrible pains in the chest and pneumonia. He was often semi-delirious and subject to delusions, such as that the bark of the trees was covered with figures and faces of men. He thought often of his children and friends, and his thoughts seemed almost to conjure them up before him. For the first time in his life he was being carried and could not raise himself to a sitting position. The Arabs were very kind to him in his extreme weakness, but the vertical sun, blistering any part of the skin exposed to it, tried him sorely in the day marches. "In July, 1870, his feet were almost consumed with irritable, eating ulcers, pulsating with pain. . . . These sores were obviously communicated by mosquitoes from the blood of the wretched slaves who were tortured with them. Livingstone could fall asleep when he wished at the shortest notice. A mat and a shady tree under which to spread it would at any time afford him a refreshing sleep. But in his last years of travel sleep was often made sad by the realistic dreams of happy English life from which he wakened to find himself ill and consumed with anxiety that he might not live to complete his mission.

"After 1880 he suffered much from the results of the decay and loss of his molar teeth, so that imperfect mastication of rough African food induced severe dyspepsia, and his bodily strength weakened under a condition of permanent malnutrition. Stanley, by relieving him when he did, gave him at least two more years of life, a certain measure of happiness and the sweet consolation that he was not forgotten and that the magnitude of his discoveries was appreciated."

DISEASED THOUGHT.

When You Realize That Is What Worry Is You Have It Mastered.

Concentrated thought is virtually irresistible. All the vast edifice of modern science and industry is obviously the product of thought, much of it of our own time and observation. The birth of an idea in the human mind is clearly the one and only dawn of empires, revolutions, of engines, philosophies, trade routes, civilization. To class worry under the head of thinking, therefore, seems a glaring sacrilege. Yet worry is thought, for all that—diseased, impure, adulterated thought. It means an admixture of emotion, of the worst of all emotions—fear—into one's thinking. Instead of concentrated, clear, serene thinking on the problem in hand, worry is thinking muddled black with fear. It is about as helpful as clapping the brakes upon wheels toiling uphill.

Yet all the world is laboring under that Egyptian heaviness of the wheels, and almost every spirit is a spirit in the dark prison of fear. But once we grasp this truth clearly, once we convince ourselves that we can rid our thought of emotionalism, of fear, the day of our deliverance is at hand. And the substitution of encouraging, healthy thought, of new channels among the worn ruts, is a powerful aid.

There may be failures and backslidings, as is customary in all mortal effort and human endeavor. But fear is weakened like a choking thing, and more and more clear and unimpeded becomes our thinking, for we realize at last, once for all, that where thinking cannot help us fear certainly will not. And then we have worry by the throat.—Collier's Weekly.

They Court Death.

Steeplejacks are proverbially reckless—or apparently so—in their actions when engaged on their dangerous work. A laborer who was attached to one of these experts used commonly to take a midday nap wherever he might happen to be situated. His mates commonly found him on the top of a steeple or chimney stretched full length upon a single board, his arms dangling over its sides, fast asleep. A single lurch would have meant a fall of a couple of hundred feet, and therefore certain death, yet he treated this possibility with the utmost indifference.—Chicago Record-Herald.

The Onion In Cooking.

The greatest of French cooks, being asked to give the secret of his success, answered: "The very foundation of all good cooking is butter and onion! I use them in all my sauces and gravies. They have the effect of making a customer come back for more. Butter without onion will drive the customer away after a few days. Boil the onion till it melts or entirely disappears; then add the butter and call the mixture stock."—Exchange.

Nerve of Her.

"How is your new maid?" "I guess she is all right; she has the baby out at present. But she has a nerve."

"How was that?"

"She wanted to take Fido along, and she is almost wholly unknown to us."—Houston Post.

All In The Game.

"Harold, you mustn't eat all the peanuts, even if you are pretending to be a monkey. You must give sister some."

"But, mother, I'm pretending she's some kind of animal wot doesn't eat peanuts."—Life.

GUNS IN A CRATER

Diamond Head, Uncle Sam's Lava Fortress In Hawaii.

GIBRALTAR OF THE PACIFIC.

The Mighty Defenses of Oahu Make That Lovely Island a Veritable Fire Lined Wall of Steel, Behind Which Crouches "the Lion of Hawaii."

Diamond Head, that monumental elevation of lava which stands out so prominently on the Honolulu side of the lovely island of Oahu, Hawaii, is the one and only original crater in the world which is being devoted to the use of the army of a great power.

The island of Oahu is the key to the Pacific, and Uncle Sam carries that key on a chain in his capacious pocket. At any time war breaks out Uncle Sam's hand, which has not lost its cunning, will go to that pocket with the swiftness of a western sheriff, and the result will be a roar of guns which will be heard around the world. The roar will be contributed to by the guns of Fort Ruger, which are at the base of Diamond Head on the landward side.

From Diamond Head, called by poets "the Lion of Hawaii," to Pearl Harbor, named by newspaper writers "the Gibraltar of the Pacific," there is a chain of forts which makes Oahu one of the greatest fortresses in the world. When in Honolulu the writer had the pleasure of working with Albert Pierce Taylor, who has been spoken of as "the recognized literary authority on things pertaining to Pearl Harbor and the defenses of Hawaii." He said on one occasion:

"Uncle Sam has declared to the world that he is on guard in the Pacific. At Pearl Harbor is Fort Kamehameha, with its battery of twelve inch guns; at the mouth of Honolulu harbor will be a battery of small guns; at Fort De Russy, Waikiki, a battery of fourteen inch guns, while at Diamond Head a battery of eight mortars has been manned for some few years. Within the extinct crater of Diamond Head Gibraltar-like galleries have been constructed, and in one of them an observatory has been established. The fire control for all the Oahu coast batteries has been located in this gallery. From this station the fire of the guns of all the forts can be directed by the electric telegraph. The guns of Pearl Harbor cross those of Diamond Head and with the batteries between make a veritable wall of steel."

After inspecting the guns at Fort Ruger two of us, with a soldier guide, walked to the entrance of the gallery which has been bored through the lava and sandstone which compose the steep sides of the crater of Diamond Head. A sentry barred the way. The permit was produced and proved the open sesame.

The heavy iron door at the entrance to the volcanic passage was swung back, and with a soldier in front and another in the rear, the visitors started down the gallery. A single narrow gauge track ran the entire length of the passage. On this steel small trucks had been pushed by the soldiers, who loaded and unloaded the debris which army comrades had dug from the walls of the crater. The ties were broken in places, and the guide issued a warning to step carefully.

On first stepping into the gallery the darkness, after the tropical sunlight, was of the kind that Milton described as visible. Only a few steps had been taken before the light at the far end of the gallery was easily seen.

Instead of the barren lava bowl, "hard as flint and as smooth as glass," as the picture man so picturesquely puts it, the inside of the crater was found to be grass covered, with trees and bushes standing here and there, which drew their moisture from the "liquid sunshine," as the Honolulu people charmingly describe the rain.

The guide pointed out the observatory high up on the Ewa side of the crater from which officers direct the shooting by the men who man the big guns at the fort outside the crater. Those men never see the target at which they aim far out at sea. The projectiles from the high powered guns pass over the crater, and by telephone from the observatory the men learn whether they have made a hit or miss. They generally score a hit.

In the event of a war involving the United States on the Pacific the crater of Diamond Head may indeed prove "the Lion of Hawaii," as Frances Bent Dillingham, a Honolulu poet, has described it, and "if once stirred his paw could sweep a navy to its death. If once aroused his roar would soon be heard across the sea and echoed from the sky."—Harold Sands in Los Angeles Times.

Quite Superfluous.

Mrs. Ellsworth had a new colored maid. One morning, as the maid came downstairs, the mistress said: "Emma, did you knock at Miss Flora's door when I sent you up with her breakfast?"

"No, ma'am," replied the maid, with preternatural gravity. "What was de use o' a knockin' at her do' w'en I knowed fo' sure she was in dar?"—New York Post.

In The Same Boat.

Her Dad (sternly)—So you want to marry my daughter, do you? Scared Sutor—Y-yes, sir, b-but not any worse than she wants to marry me.—Boston Transcript.

He Is The Truly Courageous Man Who

never desponds.—Confucius.

CUZCO AND THE INCAS.

Peru's Ancient City Was on the Plan of the Roman Camp.

The ancient city of Cuzco, when first viewed by European eyes, was, according to the best authorities, a great and wealthy municipality of perhaps 200,000 souls. How old it was at that time we have scant means of knowing. Garcilasso would have us believe that there were only thirteen Incas in the royal family line from Manco Capac to Huayna Capac. Montesinos, on the other hand, assures us that the Incas ruled a thousand years! Which are we to believe? No written history of the race exists—only the records of the jupus, those queer knotted strings which were the Incas' sole documents and for which no archaeologist has as yet discovered the key, the Rosetta stone.

Cuzco's original plan was, singularly enough, that of the Roman camp, a quadrangle divided by two intersecting streets into quarters, with a gate on each face and towers at the angles.

The Incas, like the citizens of the United States, had no more definite name for their country than Tawantinsuyu, the Empire of the Four Provinces. The four streets of the capital, prolonged by great roads, divided it into four main provinces, each under the dominion of its governor. When their people came to Cuzco they lodged in their own quarter, where they adhered to their national costumes and the customs of their own province.

The city today retains the same general plan, its two principal streets being virtually the old main thoroughfares. Its two eastern quarters lie upon steep hillsides; the two western are in the valley, where runs a little river, the Huatanay, spanned by bridges.

The northeast quarter was the Palatine hill of this South American Rome and contains the palaces of the kings, for each Inca, after the manner of the Roman emperors, built his own abode, according to live in that of his predecessor.—Scribner's Magazine.

HISTORIC NOTRE DAME.

Checked Career of the Wonderful Parisian Cathedral.

Some account of the history and vicissitudes of Notre Dame appears in the London Strand Magazine. The first cathedral was erected in the year 528 by Childbert and afterward demolished, the same site being used for the present building, which was begun in 1163 and finished in 1351.

Alexander III, laid the foundation stone, the first mass being celebrated by the patriarch Heraclius. The grand old building has been sorely beset by many dangers and has witnessed many strange and stirring scenes.

The reign of terror in 1793 led to such disgraceful orgies within the precincts of the cathedral that it was closed to the public as a place of divine worship in 1794, but was reopened in 1802 by Napoleon. The interior has suffered severely at times at the hands of the mob and individuals. The worst offender was perhaps Louis XIV., who, carrying out his father's vow, caused the destruction of the fourteenth century stalls, the high altar embellished with gold and silver statuettes, the cloisters, tombs and unique stained glasswork. In 1845 restoration was necessary in many parts of the building, the work being successfully undertaken by Lassus, Viollet le Duc and Boeswillwald.

In 1871, also during the commune, Notre Dame was menaced with grave dangers owing to the fury of the communists, who, having effected an entrance, collected all the available chairs and other combustible material and, piling them in a bonfire, drenched with oil in the center of the choir, attempted to destroy the cathedral by fire. The evil designs of the incendiaries were, however, happily frustrated by the arrival of the national guard.

Mistars Are Second Class.

Though one cannot decide what is a lady by rule of thumb, there are certain kindred problems that can be solved in that way, and the railway company knows how to solve them. Are you, for instance, an equiré or only a plain mister? The railway company can tell at once. If you hold a second class season ticket any letter comes addressed to Mr. Blank, but if you rise to a first class you become at once A. Blank, Esq. That is where the railway has the pull over the motorbus, on which there are no classes.—London Globe.

One Worse.

Binka, with a yawn, said to a fisherman: "Time ain't very valuable to you, brother; that's plain. Here I been a watchin' you three hours, and you ain't had a bite!"

"Well," drawled the fisherman, "my time's too valuable, anyhow, to waste three hours of it watchin' a feller fish that ain't gettin' a bite."—San Francisco Call.

Habits of the Hired Man.

"Well, did them moving picture people get pictures of everything on the farm?"

"Everything but the gosh blamed hired man," said Farmer Heck. "They couldn't catch him in motion."—Kansas City Journal.

Cheering.

Mrs. Kanga—If I were to die you'd never get another wife like me. Kanga—It's very kind of you to say that.—Boston Transcript.

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There is no method without order and punctuality.—Hannah More.

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Prisoners On Hunger Strike.

Kansas City, Mo., Oct. 8.—The last of three who went on a hunger strike eight days ago, rather than work on the rockpile, to which they were sentenced for petty larceny, gave in today. They are breaking rock, having admitted to Judge Latahaw, of the Criminal Court, they are very fond of work—and food.

Joseph Carney, the last man to surrender, was founder of the starvation squad. A week ago when he, Sterling Price and Russel Welch were sentenced, Carney said he did not see why the system used by suffragettes in England would not work in Missouri. Price and Welch didn't see either, so the three refused food.

The strikers were confined in cells on a diet of distilled water. Welch called for meat and work in five days. Price lasted seven and Carney a scant eight.

Deafness Cannot Be Cured.

By local applications, as they cannot reach the diseased portion of the ear. There is only one way to cure deafness, and that is by constitutional remedies. Deafness is caused by an inflamed condition of the mucous lining of the Eustachian Tube. When this tube is inflamed you have a rumbling sound or imperfect hearing, and when it is entirely closed, Deafness is the result, and unless the inflammation can be taken out and this tube restored to its normal condition, hearing will be destroyed forever; nine cases out of ten are caused by Catarrh which is nothing but an inflamed condition of the mucous surfaces.

We will give One Hundred Dollars for any case of Deafness (caused by catarrh) that cannot be cured by Hall's Catarrh Cure. Send for circulars free. F. J. CHENEY & CO., Toledo, O.

Sold by Druggists, 75c. Take Hall's Family Pills for constipation.

Sleeps For 34 Days.

San Jose, Cal., Oct. 4.—Wright Keeble, 18, kept for thirty-three days in the hay on his uncle's farm before his sickness was discovered. Young Keeble still further puzzled physicians when the mysterious and dreadful coma left him for a moment recently. He muttered words indistinctly and again lapsed into a state of coma.

Sick headache is caused by a disordered stomach. Take Chamberlain's Tablets and correct that and the headaches will disappear. For sale by all dealers.

Old Shoe Key to Murder.

Gulfport, Miss., Oct. 4.—An old shoe found beside a badly decomposed body in a swamp several days ago, led to the identification of the body as that of Guy Johnson, aged 16 years, the arrest of three negroes and a confession from one of them, according to the police.

The boy left home to go to a neighbor's house the evening of June 8 and had not been heard from until his body, showing effects of violence, was found in a swamp near Haudaboro.

Helson Flowers, Ed Labbett and Vessey Scott, all negroes, were arrested today and officers told them Labbett killed the boy and that he (Flowers) was an accomplice. They say Flowers exonerated Scott of participation in the crime. The motive for the killing was not made known.

Require Only Small Outfit.

The active Arab barbers require only a pair of scissors, a pair of clippers, and a razor for their equipment. They erect their temporary shops in the market-places by spreading some matting over a few poles. Arabs have their heads shaved, keeping the hair short so that the white skull cap over which the fox is worn will fit closely.

Almost A Miracle.

One of the most startling changes ever seen in any man, according to W. B. Holstetaw, Clarendon, Tex., was effected years ago in his brother. "He had such a dreadful cough," he writes, "that all our family thought he was going into consumption, but he began to use Dr. King's New Discovery, and was completely cured by ten bottles. Now he is sound and well and weighs 218 pounds. For many years our family has used this wonderful remedy for Coughs and Colds with excellent results." It's quick, safe, reliable and guaranteed. Price 50 cents and \$1.00. Trial bottle free at all druggists.

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Things never look bright to one with "the blues." Ten to one the trouble is a sluggish liver, filling the system with bilious poison, that Dr. King's New Life Pills would expel. Try them. Let the joy of better feelings and "the blues." Best for stomach, liver and kidneys. 25c at all druggists.

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